WHAT IS CLAIMED IS:

1. An integrated optical element, comprising:

an optical semiconductor element including a light emission layer and outputting light of a predetermined wavelength;

an optical circuit element including a substrate, an optical waveguide in which the light from said optical semiconductor element propagates and which is provided on said substrate, and a grating formed in said optical waveguide and constituting an external resonator together with said optical semiconductor element;

a silicon bench having an element mount surface on which said optical semiconductor element and said optical circuit element are mounted; and

a bonding material for fixing said optical circuit element in a predetermined position on the element mount surface of said silicon bench, while being apart from said silicon bench at a predetermined distance.

2. An integrated optical element according to claim 1, wherein a placement position of the light emission layer, in a cross-section of said optical semiconductor element that is orthogonal to the light emission layer, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical semiconductor element is placed on the element mount surface of said silicon bench such that a distance between

the light emission layer and said silicon bench is minimized; and,

wherein a placement position of said optical waveguide, in a cross-section of said optical circuit element that is orthogonal to said optical waveguide, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical circuit element is placed on the element mount surface of said silicon bench such that a distance between said optical waveguide and said silicon bench is minimized.

3. An integrated optical element according to claim 1, wherein said optical semiconductor element includes a semiconductor optical amplifier whose end face facing said optical waveguide in said optical circuit element is Anti-Reflection coated.

4. An integrated optical element according to claim 1, wherein an interval between an end face of said optical semiconductor element facing said optical waveguide and said optical waveguide in said optical circuit element is filled with resin.

5. An integrated optical element according to claim 4, wherein the resin has a refractive index of 1.300 or more but 1.444 or less.

6. An integrated optical semiconductor element according to claim 1, wherein an end face of said optical circuit element which faces the optical semiconductor

element is inclined at an angle of 3° or more but 8° or less with respect to a surface that is orthogonal to an optical axis of the light from said optical semiconductor element.

7. An integrated optical semiconductor element according to claim 1, wherein said substrate in said optical circuit element includes a silica-based substrate.

8. An integrated optical element according to claim 1, wherein an optical semiconductor element has a spot-size conversion structure whose FFP is 15° or less; and

a relative refractive index difference between a core and a cladding of said optical waveguide in said optical circuit element is 1.0% or more.

9. A method for fabricating an optical semiconductor element according to claim 1, comprising the steps of:

preparing an optical semiconductor element including a light emission layer and outputting light of a predetermined wavelength;

preparing an optical circuit element including a substrate, an optical waveguide in which the light from said optical semiconductor element propagates and which is provided on said substrate, and a grating formed in said optical waveguide and constituting an external resonator together with said optical semiconductor element;

preparing a silicon bench;

fixing said optical semiconductor element in a first region on an element mount surface of said silicon bench

via a first bonding material; and

fixing said optical circuit element in a second region on the element mount surface of said silicon bench via a second bonding material, the second region differing from the first region.

10. A method according to claim 9, wherein a placement position of the light emission layer, in a cross-section of said optical semiconductor element that is orthogonal to the light emission layer, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical semiconductor element is placed on the element mount surface of said silicon bench such that a distance between the light emission layer and said silicon bench is minimized, and

wherein a placement position of said optical waveguide, in a cross-section of said optical circuit element that is orthogonal to said optical waveguide, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical circuit element is placed on the element mount surface of said silicon bench such that a distance between said optical waveguide and said silicon bench is minimized.

11. A method according to claim 9, wherein glass layers for a core and a cladding constituting said optical waveguide in said optical circuit element are formed by

CVD.

12. A method according to claim 9, wherein, on the element mount surface of the silicon bench by means of a KOH etching process, a V groove for mounting an optical fiber to which the light from said optical waveguide in said optical circuit element is input, and an alignment mark for recognition by a die bonder when said optical semiconductor element and said optical circuit element are mounted, are formed batchwise.

13. A method according to claim 9, wherein said optical circuit element is mounted on the element mount surface after said optical semiconductor element has been mounted on the element mount surface of said silicon bench.

14. A light source module, including an integrated optical element according to claim 1.

15. An integrated optical element, comprising:

N (integer of 2 or more) optical semiconductor elements each including a light emission layer;

an optical circuit element including a substrate, N optical waveguides each corresponding to the associated one of said N optical semiconductor elements and provided on said substrate, and N gratings each formed in the associated one of said N optical waveguides and having a reflection peak wavelength different from each other;

a silicon bench having an element mount surface on which said N optical semiconductor elements and said

optical circuit element are mounted; and

a bonding material provided between each of said N optical semiconductor elements and said silicon bench, and fixing said optical semiconductor elements in predetermined positions on the element mount surface of said silicon bench.

16. An integrated optical element according to claim 15, wherein said optical circuit element further includes an optical multiplexer for multiplexing the light propagating through said N optical waveguides.

17. An integrated optical element according to claim 15, wherein a placement position of the light emission layer, in a cross-section of each of said N optical semiconductor elements that is orthogonal to the light emission layer, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said N optical semiconductor elements are each placed on the element mount surface of said silicon bench such that a distance between the light emission layer and said silicon bench is minimized, and

wherein a placement position of each of said N optical waveguides, in a cross-section of said optical circuit element that is orthogonal to said N optical waveguides, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical circuit element is placed

on the element mount surface of said silicon bench such that a distance between said N optical waveguides and said silicon bench is minimized.

18. An integrated optical element according to claim 15, wherein each of said N optical semiconductor elements includes a semiconductor optical amplifier whose end face facing the associated one of said N optical waveguides in said optical circuit element is Anti-Reflection coated.

19. An integrated optical element according to claim 15, wherein an interval between respective end faces of said N semiconductor optical amplifiers facing said N optical waveguides and said N optical waveguides in said optical circuit element is filled with resin.

20. An integrated optical element according to claim 19, wherein the resin has a refractive index of 1.300 or more but 1.444 or less.

21. An integrated optical semiconductor element according to claim 15, wherein respective end faces of said optical circuit element facing said N optical semiconductor elements is inclined at an angle of 3° or more but 8° or less with respect to a surface that is orthogonal to an optical axis of the light from said N optical semiconductor elements.

22. An integrated optical semiconductor element according to claim 15, wherein said substrate in said optical circuit element include a silica-based substrate.

23. An integrated optical element according to claim 15, wherein each of said N semiconductor optical amplifiers has a spot-size conversion structure whose FFP is 15° or less, and

wherein a relative refractive index core and a cladding of each of said N optical waveguides in said optical circuit element is 1.0% or more.

24. A method for fabricating an optical semiconductor element according to claim 15, comprising the steps of:

preparing N (integer of 2 or more) optical semiconductor elements each including a light emission layer and outputting light of mutually different wavelengths;

preparing an optical circuit element including a substrate, N optical waveguides each corresponding to the associated one of said N optical semiconductor elements and provided on said substrate, and N gratings each formed in the associated one of said N optical waveguides and having a reflection peak wavelength different from each other;

preparing a silicon bench;

fixing each of said N optical semiconductor elements in first regions on the element mount surface of said silicon bench via a first bonding material; and

fixing said optical circuit element in a second region on the element mount surface of said silicon bench

via a second bonding material, the second region differing from the first regions.

25. A method according to claim 24, wherein a placement position of the light emission layer, in a cross-section of each of said N optical semiconductor elements that is orthogonal to the light emission layer, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said N optical semiconductor elements are each placed on the element mount surface of said silicon bench such that a distance between the light emission layer and said silicon bench is minimized, and

wherein a placement position of each of said N optical waveguides, in a cross-section of said optical circuit element that is orthogonal to said N optical waveguides, is shifted further toward an outer periphery side of the cross-section than a center of the cross-section, and said optical circuit element is placed on the element mount surface of said silicon bench such that a distance between said N optical waveguides and said silicon bench is minimized.

26. A method according to claim 24, wherein glass layers for a core and a cladding constituting each of said N optical waveguides in said optical circuit element are formed by CVD.

27. A method according to claim 24, wherein, on the

element mount surface of the silicon bench by means of a KOH etching process, V grooves each for mounting optical fibers to which the light from said N optical waveguides in said optical circuit element is input, and alignment marks each for recognition by a die bonder when said N optical semiconductor elements and said optical circuit element are mounted, are formed batchwise.

28. A method according to claim 24, wherein said optical circuit element is mounted on the element mount surface after said N optical semiconductor elements have been mounted on the element mount surface of said silicon bench.

29. A light source module, including an integrated optical element according to claim 15.